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Website design quality and usage behavior: Unified Theory of Acceptance and Use of Technology

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ABSTRACT

Firms gain many benefits from well-designed websites. But which elements of website design quality really matter, and how do these elements influence usage behavior? With the Unified Theory of Acceptance and Use of Technology (UTAUT) as the theoretical foundation, this paper proposes that website design quality is a multi-dimensional construct with a higher-order structure that, when successfully incorporated into the UTAUT model, outperforms existing models. Results are based on a survey of 216 users of Internet banking. Findings indicate that the technical, general content and appearance dimensions of a website are most important for users. These dimensions are significantly related to usage behavior directly and indirectly. A halo effect may influence overall evaluation of a website because the dimensions of website design quality are interrelated. The implication is that improvements to the appearance of a website should enhance the overall evaluation of the site, leading to greater usage intentions.

Keywords: Online behavior, Website design quality dimensions, Usage behavior, Technology acceptance

1. Introduction

Advances in Internet technologies and related applications enable consumers to interact with firms in new ways. Increasingly more organizations are investing heavily in customer-directed online source technologies in an effort to increase their share of the online marketplace. As Vila and Kuster (2011) observe, firms apply a substantial proportion of these efforts to improve the design of their websites and to enhance the quality of customers' interaction experiences. Furthermore, research commonly examines the relationship between website design and consumer behavior (e.g., Kwon, Kim, & Lee, 2002; Moss, Gunn, & Heller, 2006).

Despite the importance of website design, previous research does not provide consistent information on which website attributes influence users' perceptions. Thongpapanl and Ashraf (2011, p. 3) note that "studies to date report conflicting results regarding the amount of information that a website should provide in order to reduce customer risk perception and enable informed purchase decisions." Similarly, Gounaris, Koritos, and Vassilikopoulou (2010) highlight the importance of atmospherics in the process of an online transaction. Following similar calls for further research into this area (Andrews & Bianchi, 2013; Cortinas, Chocarro, & Villanueva, 2010; Toufaily, Ricard, & Perrien, 2013), this study examines how website design elements and the quality of interaction experience influence consumer behavior by means of the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh, Morris, Davis, & Davis, 2003).

The context for the inquiry is online banking services. Consumer behavior is task oriented in banking (Lee, Park, Chung, & Blakeney, 2012), and consumers can voluntarily choose between multiple channels to conduct transactions, such as by computer, mobile phone, tablet, or face-to-face banking. However, the majority tend to use more than one channel. The selected channel may also depend on the type of transaction—for example, face-to-face banking for high-involvement transactions (loans) and online channels for low-involvement transactions (balancing checking) (Cortinas et al., 2010). Banks operate in a competitive environment, and to differentiate their online operations, they tend to emphasize different characteristics of website design—either utilitarian (product-related information, navigation) or hedonic (aesthetics) aspects—to facilitate the transaction experience for consumers (Gounaris et al., 2010) and meet the needs of different consumer segments (Floh, Zauner, Koller, & Rusch, 2013).

This study aims to contribute to the literature on website design by using the context of online banking to evaluate and enhance the UTAUT. Section 2 provides background information on the theoretical basis of the study and also presents the hypotheses and the conceptual model of the role of website design quality in influencing behavior. Sections 3 and 4 detail the research method, results, and analysis. Section 5 concludes with a discussion of outcomes, and section 6 presents theoretical and managerial implications, the limitations of the study, and suggested directions for further research.

2. Conceptual framework and hypotheses development

Most research on the adoption and continued use of technology is based on the Technology Acceptance Model (TAM) (Davis, 1989). Although the original purpose of the TAM is to model technology use in the workplace, researchers also apply TAM in consumer Internet adoption studies, such as mobile Internet services (Jiang, 2009). TAM helps explain customers' adoption of technology within the financial service context (Proenca & Ridriguez, 2011) and, more specifically, the adoption of online banking (Alsajjan & Dennis, 2010; Gounaris et al., 2010). Theories such as Diffusion of Innovation (Rogers, 1983) tackle technology acceptance from a different perspective—characteristics of innovation that induce adoption and consumers' characteristics associated with adoption stages and rates. Similarly, the Theory of Reasoned Action (Ajzen & Fishbein, 1980) and

the Theory of Planned Behavior (Ajzen, 1991), two theoretical foundations extensively applied to explain consumer behavior, address technology acceptance from a belief approach. The UTAUT (Venkatesh et al., 2003) is based on and extends TAM in an attempt to integrate the eight most used models in technology acceptance research into one parsimonious model. The UTAUT therefore comprises the framework for the current study on Internet banking adoption.

UTAUT has four key constructs that influence behavioral intention and actual use of technology: performance expectancy, effort expectancy, social influence, and facilitating conditions. This study adapts constructs and definitions from UTAUT to the consumer technology acceptance and use context. *Performance expectancy* is the degree to which use of technology helps consumers perform certain activities; *effort expectancy* is the ease with which consumers use technology; *social influence* is the extent to which consumers believe that important others (e.g., family and friends) think they should use a particular technology; and *facilitating conditions* refer to consumers' perceptions of the resources and support available to perform a behavior (Brown & Venkatesh, 2005; Venkatesh et al., 2003). According to UTAUT, performance expectancy, effort expectancy, and social norms influence behavioral intention to use technology, while behavioral intention and facilitating conditions determine technology use. This study treats "effort expectancy" in UTAUT as conceptually equivalent to "ease of use" in TAM. Similarly, "performance expectancy" (in UTAUT) is conceptually equivalent to "usefulness" (in TAM). In addition, individual difference variables, including age, gender, and experience (as well as voluntariness, which is part of the original UTAUT) moderate various UTAUT relationships.

This study aims to extend UTAUT by exploring the relationships among performance expectancy, effort expectancy, and social influence. In their inquiry into the relationship between performance expectancy and effort expectancy, Brown and Venkatesh (2005) opine that performance expectancy is the degree to which using an online banking website aids consumers in performing banking activities. With this definition, performance expectancy can also influence effort expectancy, or the ease with which consumers believe that they can execute online banking activities. Support for this reasoning derives from studies reporting that when consumers perceive technology as easy to use (higher effort expectancy), they also believe that the technology is more useful (higher performance expectancy); higher performance expectancy leads to stronger intentions to use (Davis, Bagozzi, & Warshaw, 1989). Ha and Stoel (2009) and Smith, Deitz, Royne, Hansen, Grünhagen, and Witte (2013) apply this model to Internet shopping, and McKechnie, Winklhofer, and Ennew (2006) apply the model to online financial services. Therefore:

H1. Effort expectancy has a positive effect on performance expectancy.

Regarding the relationship between social influence and performance expectancy, Brown and Venkatesh (2005) identify the former as the extent to which consumers believe that important others (family, friends, and other peers) think they should use online banking. The current study thus suggests that social influence is positively related to performance expectancy. That is, important others' beliefs influence people's assessments of whether an action is useful, in line with Fishbein and Ajzen's (1975, p. 302) notion of *subjective norms*, defined as a "person's perception that most people who are important to [her/him] think [s/he] should or should not perform the behavior in question." Given the proximity of the definitions, social influence is similar in conceptual foundation to subjective norm. Venkatesh and Davis (2000) elaborate on this argument by suggesting that consumers generally know that using online banking website technology will garner benefits, even if they themselves are not favorable toward the behavior or its consequences, if they believe that one or more important referents think they should. This perception may make them sufficiently motivated to comply with the referents. In addition, the stronger the social influence, the sooner a consumer will

adopt a new technology (Kim & Park, 2011). Therefore, stronger social influences cause consumers to perceive a technology as more useful (higher performance expectancy), resulting in stronger usage intentions (Venkatesh, 2000; Venkatesh et al., 2003). Thus:

H2. Social influence has a positive effect on performance expectancy.

In summary, greater effort expectancy and social influence have positive effects on performance expectancy. In turn, these effects lead to stronger usage intentions because consumers' satisfaction with a service depends on their expectations of the performance of the service (Choi, Kim, & Kim, 2011). Thus:

H3. Performance expectancy mediates the relationships between usage and (a) effort expectancy and (b) social influence.

The UTAUT model identifies *facilitating conditions* as a construct that reflects a person's perception of his or her control over behavior (Venkatesh, Brown, Maruping, & Bala, 2008). As noted previously, facilitating conditions refer to perceptions of the resources and support available to perform a behavior. This study promotes the notion that website design quality encapsulates the meaning of facilitating conditions.

Research extensively examines the relationship between website elements and their influence on usage intentions, online behavior, and overall system satisfaction (e.g., Bauer, Falk, & Hammerschmidt, 2006; Bauer, Hammerschmidt, & Falk, 2005; Blake, Neuendorf, & Valdiserri, 2005; Dickinger & Stangl, 2013; Floh & Treiblmaier, 2006; Gan, Clemes, Limsombunchai, & Weng, 2006; Torkzadeh & Dhillon, 2002). Dennis, Merrilees, Jayawardhena, and Wright (2009) introduce the term "web atmospherics" to describe the web design elements that constitute the primary drivers of online behavior. Jayawardhena and Wright (2009) demonstrate that web attributes influence online behavior. Aladwani and Palvia (2002) examine the key characteristics of website design quality from the user's perspective. The current research adopts Aladwani and Palvia's definition of perceived web quality as users' evaluations of a website's features that meet their needs and reflect overall excellence of the website.

Aladwani (2006) proposes a model that examines the influence of four sub-dimensions of a website on attitudes and purchase intentions of web consumers. The first component of this model is the *technical dimension*, which refers to website characteristics such as security, ease of navigation, search facilities, site availability, valid links, personalization or customization, speed of page loading, interactivity, and ease of access. The second component is the *general content*, which includes characteristics such as content usefulness, completeness, clarity, currency, conciseness, and accuracy. The third component is the *specific content*, which entails characteristics such as contact information, general company information, product/service details, consumer policies, and customer support. The final component is *appearance*, which refers to characteristics such as attractiveness, organization, proper use of fonts, colors, and proper use of multimedia. Previous research considers content quality a conceptually different construct from website design (Dickinger & Stangl, 2013). The current study suggests that these constructs are interrelated and therefore treats them as sub-dimensions of website design quality (or web quality for short), a second-order construct indicated by these components. The linkages proposed parallel those advanced in information systems research (DeLone & Mclean, 2003). Therefore:

H4. Website design quality elements are positively related to usage.

Venkatesh et al. (2003) argue that performance expectancy explains why people use technology to achieve their ends and that facilitating conditions influence such behaviors. This study now advances the notion that web design quality (facilitating conditions) influences not only usage (behaviors) but also performance expectations, because if people believe that they will benefit from a high-quality online banking website, not only will they use the website, but they will also raise their evaluations of its usefulness. Researchers report such a relationship in systems design (Davis, 1989; Igarria, Guimaraes, & Davis, 1995; Lee & Lin, 2005; Schaupp, Fan, & Belanger, 2006), mobile banking (Lee et al., 2012), and Internet banking (Alsajjan & Dennis, 2010). These research strands suggest a mediating role of performance expectancy between web design quality dimensions and Internet banking usage:

H5. Website design quality has an indirect effect on usage through performance expectancy.

Research from social psychology suggests that direct experience with an attitude object enhances both attitude evaluation and accessibility in memory, which indirectly influence behavior (Fazio, Chen, McDonel, & Sherman, 1982). In line with this theoretical approach, researchers report that expertise and proficiency influence the use of technology (Lassar, Manolis, & Lassar, 2005; Novak, Hoffman, & Yung, 2000; Toufaily et al., 2013). Experienced website users may form more positive perceptions of effort expectancy, performance expectancy, and website quality. Research supports these relationships in technology acceptance contexts. First, users' general computer experience affects their perceptions of effort expectancy (Guriting & Ndubisi, 2006). Similarly, Andrews and Bianchi (2013) report a positive relationship between similar system experience and effort expectancy that applies not only to the adoption of a service but also to its continued use. Experience also affects performance expectancy (Dishaw, Brent, & Strong, 2002; Johnson & Marakas, 2000; Taylor & Todd, 1995a). Thus:

H6. Experience has a positive effect on effort expectancy.

H7. Experience has a positive effect on performance expectancy.

The enhancement of attitude evaluations with experience also affects users' perceptions of facilitating conditions, in that users who are less experienced perceive greater controls of their behavior (King & Dennis, 2003; Taylor & Todd, 1995c). Research on computer-human behavior reports that computer experience significantly affects people's perceptions of computers and web technologies (Liaw, 2002). The positive effect of experience on attitudes toward facilitating conditions and web technologies leads to the following:

H8. Experience has a positive effect on website design quality perceptions.

Figure 1 illustrates the framework in which website design quality elements drive Internet banking behaviors, mediated by performance expectancy. Performance expectancy is positively related to social influence, experience, and effort expectancy. The following section outlines the method for testing the hypotheses.

<Take in Figure 1 about here>

3. Method

To test the proposed UTAUT extension, the data comprised current users of Internet banking in the United Kingdom. Prior research (Aladwani, 2006; Venkatesh et al., 2003) forms the basis for measures, adapted when necessary to the Internet banking context (Table 1). The instrument was also pilot tested with a group of university graduate students and staff to verify clarity of meaning and comprehension, as well as functionality with respect to guidelines and time needed for completion.

Owing to data protection restrictions, contacting users through banks was not an option. However, because most people are users of banking services, convenience mall intercept sampling served to draw a broad cross-section of consumers. Three city centers accounting for differing lifestyles were targeted. The final sample consisted of 216 participants. Confirmatory factor analysis (CFA) helped establish discriminant and convergent validity, followed by structural equation modeling to test hypotheses, both using SPSS Amos.

<Take in Table 1 about here>

4. Results

4.1. Descriptive statistics

The sample comprised 78 (36%) women and 138 (64%) men; the majority (70%) had a high level of education (bachelor's degree or higher); and 35% were between the ages of 21 and 30 years, and 30% were between the ages of 31 and 40 years. The financial profile of the respondents also varied; their incomes fell into four equally distributed income categories. The relatively high level of education and predominance of men in the sample reflect the profile of online banking customers in the United Kingdom and across multiple European countries (Aldás-Manzano, Lassala-Navarré, Ruiz-Mafé, & Sanz-Blas, 2009; Gounaris et al., 2010; Yousafzai & Yani-de-Soriano, 2012).

4.2. Part 1: Validation of the website design quality structure

Part 1 of the two-part analysis aimed to validate the measures of website quality structure with its four dimensions and to introduce the website quality concept as a higher-order structure. Before incorporating website quality perceptions as a multi-dimensional construct, this study tested the four dimensions of the website quality by examining direct links to usage behavior (i.e., a conventional first-order model). The test results did not lend support to the direct links, but the four dimensions showed correlations among each other, in support of the hypothesized second-order factor approach.¹ A second-order model is applicable when a higher-order factor is hypothesized to account for relationships among the lower-order factors (Chen, Sousa, & West, 2005). Accordingly, analysis proceeded by testing website quality as a multi-dimensional construct.

First, the study tested the factorial validity of the theoretical construct—namely, website quality perceptions. This step examined the first-order CFA model design that suggests that website quality

¹ Space constraints prevent presenting the details of the first-order results here, details available on request.

responses comprise four factors: technical quality, general content quality, special content quality, and appearance quality. Consistent with theory, the four factors are correlated, indicating the higher-order construct of website quality.

Second, the analysis employed CFA, using SPSS Amos, and was run several times on the first-order structure, applying the refinement criteria guidelines of Hair, Blake, Babin, and Tatham (2006) and Byrne (2001); standardized regression weights (factor loadings) values should be above 0.5 and preferably above 0.7, squared multiple correlations should be above 0.5, standardized residual covariances should be below 2.58 or above -2.58, and items for which the modification indices reveal high covariance between measurement errors accompanied by high regression weights between these errors' constructs are candidates for deletion. The specification, after applying the refinement criteria, resulted in model fit statistics indicating a good fit: $\chi^2 = 86.19$ (df = 59), comparative fit index (CFI) = 0.986, and root mean square error of approximation (RMSEA) = 0.047.

The findings confirm that the website design quality perceptions construct is best presented as a multi-dimensional construct consisting of technical quality, general content quality, special content quality, and appearance quality. This result at the first-order level permits proceeding to the second stage. Introducing the higher-order construct, website design quality perceptions, requires constraining the variance of the higher-order construct to a value of, for example, 1 or constraining one of the paths to a value of 1. This stage applied the first option. The first run after introducing the second-order factor revealed a need for modifications, as the component special content quality had low factor loadings below 0.5, and therefore this component was excluded from subsequent analysis. The model fit statistics indicated a good fit: $\chi^2 = 45.92$ (df = 32), CFI = 0.991, and RMSEA = 0.046.

Identification of the higher-order portion of the model (Byrne, 2001) showed that the higher-order level of the raw model was just identified with zero degrees of freedom. One approach for resolving the issue of just identification is to place equality constraints on particular parameters known to yield estimates that are approximately equal. "Critical ratio" (i.e., t) differences are a useful exploratory mechanism for detecting candidate parameters for the imposition of equality constraints (Byrne, 2001).

The first-order residuals related to F2 (technical quality) and F4 (appearance quality) have estimated values that are almost identical, and the F1 (technical quality) residual is also close to the other two (Table 2). The critical ratio difference values are less than 1.96; therefore, the variances related to the three residuals were considered equal. As such, the modified higher-order-level model was over-identified with two degrees of freedom (Byrne, 2001). After model re-specification, the fit statistics were $\chi^2 = 47.832$ (df = 34), CFI = 0.991, and RMSEA = 0.045, indicating a good fit. All factor loadings were also above 0.7, and the squared multiple correlations were above 0.6. Thus, this model is representative of the structure of website design quality item scores. With establishment of an acceptable level of model fit, the next step was to introduce the higher-order factor, website design quality perceptions, into the modified UTAUT model and to test the relationships among the variables in the structural model.

<Take in Table 2 about here>

4.3. Part 2: Incorporating the higher-order construct into the UTAUT research model

4.3.1. Measurement model

The model fit statistics for the measurement model incorporating the website design quality perceptions higher-order structure indicate a good fit ($\chi^2 = 293.707$, $df = 195$; CFI = 0.972; and RMSEA = 0.050). The results from the CFA indicate convergent validity (Table 3). The square roots of the average variances extracted of the constructs are higher than the correlations between constructs, demonstrating discriminant validity (Table 4).

<Take in Tables 3 and 4 here>

4.3.2. Structural model

The social influence variable did not have a significant impact on the other constructs, and therefore this variable was excluded from subsequent analysis. The final fit statistics of the structural equation model indicate a good fit ($\chi^2 = 239.754$, $df = 162$; CFI = 0.975; RMSEA = 0.048). The structural model with path weights and t-values is reported in Figure 2 and Table 5.

<Take in Figure 2 and Table 5 about here>

4.3.3. Hypotheses testing

The coefficient for the effort expectancy–performance expectancy path was significant, in support of H1; however, the coefficient for the social influence–performance expectancy path was non-significant; thus, both H2 and H3b are not supported. In the absence of performance expectancy, effort expectancy was significantly associated with Internet banking usage, but when performance expectancy was included as an intervening variable, the direct effect of effort expectancy on Internet banking usage became non-significant. Thus, performance expectancy had a mediating role on the effect of effort expectancy on Internet banking usage, in support of H3a.

However, the direct relationship between website design quality perceptions and Internet banking usage remained, even when performance expectancy was included as an intervening variable, in support of H4 and H5. Experience had a significant impact on both effort expectancy, in support of H6, and website design quality perceptions, in support of H8. In the absence of effort expectancy, experience had a significant impact on website design quality perceptions, but when effort expectancy acted as an intervening variable, the direct effect of experience on website design quality perceptions became non-significant. Thus, effort expectancy had a mediating role on the effect of performance expectancy on website design quality perceptions. In line with H7, performance expectancy had an effect on website design quality perceptions, but this effect was indirect.

The extended model explains 57% of reported Internet usage behavior (Table 4) (adjusted $R^2 = 0.55$). This percentage compares with the UTAUT that Venkatesh et al. (2003) report as having an explanatory power of 70%, but that refers only to intentions to use (rather than actual use). The TAM explains only 40% of intentions to use and 30% of actual use (see Burton-Jones & Hubona, 2005). Therefore, the explanatory power of the extension performs well in modeling actual usage compared with previous studies.

5. Discussion

This study examines how web design quality aspects influence consumer behavior and elaborates the UTAUT by exploring the influence of website design quality perceptions on online behavior. The study reveals significant relationships between the constructs in question and explores the nature of the website design quality construct.

5.1. Website design quality structure

The testing and validation of website design quality perceptions as a multi-dimensional construct using CFA produced specifications that indicated good representation for each of the four dimensions (three items per variable) and good model fit indices. Thus, website design quality is best represented by a multi-dimensional structure rather than a uni-dimensional construct, as previous research suggests (Dickinger & Stangl, 2013). The elements of website design quality dimensions that respondents highly rated are ease of navigation, access, and loading time (technical quality); content usefulness, competence, clarity, and accuracy (general content quality); and attractiveness, organization, and readability (appearance quality). These findings confirm prior Internet banking research (Jun & Cai, 2001; Pikkarainen, Pikkarainen, Karjaluoto, & Pahlila, 2004).

5.2. Social influences–performance expectancy

The impact of social influences on performance expectancy was non-significant. This result is consistent with previous research that indicates that the impact of social influence vanishes under voluntary usage conditions and that users may depend on their own beliefs rather than on others' opinions or may use their direct experience with a system to form intentions or perceptions of usefulness (Morris & Venkatesh, 2000; Taylor & Todd, 1995c; Venkatesh & Davis, 2000; Venkatesh et al., 2003). Karahanna and Straub (1999) argue that social norms have a stronger influence on the behavior of inexperienced potential system adopters than on the behavior of experienced users (e.g., experienced people using Internet banking under discretionary usage conditions as in this study).

5.3. Comparison of findings with the TAM

The significant effort expectancy–performance expectancy path is equivalent to the perceived ease of use–perceived usefulness path in TAM. Prior research indicates that the impact of perceived ease of use on behavioral intention and usage is inconsistent and ascribes this inconsistency to the degree of system complexity and the role of experience as a moderator (Igbaria, Zinatelli, Cragg, & Cavaye, 1997; Sun & Zhang, 2006). Specifically, perceived ease of use affects usage or behavioral intentions when the technology is more complex and people are less experienced. Respondents in the current study are actual users, and thus they have system experience. Prior research also shows that perceived ease of use is a significant antecedent of perceived usefulness; that is, perceived ease of use affects acceptance of systems indirectly through perceived usefulness (Davis et al., 1992). Furthermore, the performance expectancy–Internet banking usage link is significant and that performance expectancy has the highest standardized direct effect (0.513) on usage behavior. The current study finds support for the mediating role of performance expectancy on the effort expectancy–Internet banking usage relationship but no support for the mediating role of performance expectancy between social influence and Internet banking usage, as social influence–performance expectancy (H2) was non-significant.

5.4. Impact of website design quality

The website design quality dimension replaces the technological resources of facilitating conditions in Venkatesh et al.'s (2003) UTAUT model. The results demonstrate that website design quality perceptions have both a direct and indirect impact on usage behavior. The standardized direct impact of website design quality–Internet banking usage is 0.265, while website design quality–performance expectancy is 0.331. The standardized total effect of website design quality–Internet banking usage (0.536) is greater than that of performance expectancy–Internet banking usage (0.513), indicating that website design quality exerts a greater impact than performance expectancy on usage behavior. These results confirm findings from previous research: website design quality (referred to as information system quality) affects perceived usefulness (Ahn, Ryu, & Han, 2007; Lin & Lu, 2000; Yi & Jiang, 2007). The results are also consistent with prior Internet banking research: website design quality features such as access, navigation, and speed are determinants of both Internet banking adoption and perceived usefulness (Jaruwachirathanakul & Fink, 2005); perceived usefulness and information on online banking are the main factors influencing online banking acceptance (Pikkarainen et al., 2004).

5.5. The role of experience

Prior research establishes the importance of actual behavior experience in the development of beliefs such as perceived ease of use (Davis et al., 1989; Venkatesh & Davis, 1996). With increasing computer and Internet knowledge and experience, people tend to fine-tune their system-specific perceived ease of use to reflect their interaction with the system or, in this case, their online access in general (Venkatesh, 2000). Experience has a direct impact on effort expectancy, whereas its impact on performance expectancy is indirect through effort expectancy. The mediating role of effort expectancy is logical: people's computing and Internet knowledge enables them to make judgments about website effort expectancies and, thus, website performance expectancies. The results from information system studies generally indicate a positive relationship between information system experience and ease of use and usefulness (Nysveen & Pedersen, 2004). The impact of experience on website design quality perception also confirms previous information systems research that identifies experience as an antecedent to perceived behavioral control (Theory of Planned Behavior model: Taylor & Todd 1995b), similar to facilitating conditions (UTAUT model: Venkatesh et al., 2003; Venkatesh et al., 2008).

In summary, the results demonstrate that website design quality perceptions constitute a multi-dimensional concept. Website design quality has an impact (direct and indirect) on online usage behavior, and its total impact is greater than that of any other construct in the model. The results also suggest that the previously established links among the TAM constructs are also valid among the UTAUT constructs. In addition, this study is the first to extend the UTAUT by adding website design quality as a second-order variable. As such, this work adds to the understanding of technology adoption within theories of technology acceptance research and in discretionary online behavior contexts. The extended model provides an avenue to conceptualize how various web design quality choices might influence overall website design quality perceptions through the attributes of the design quality dimensions. The model provides an approach for linking website design quality perceptions to their ultimate effects on consumer usage behavior.

6. Conclusion

6.1. Theoretical contributions

The theoretical framework tested raises several challenging implications. The first contribution lies in the validation of website design quality as a higher-order structure; in contrast, Aladwani and Palvia (2002) develop, test, and validate their dimensions as a first-order structure, and Dickinger and Stangl (2013) treat website design quality as a uni-dimensional construct. The current study

shows that the interrelationships among the dimensions represent an overall evaluation that can be described as a halo effect.

Second, the extended UTAUT model, which incorporates the website design quality higher-order structure, accounts for the quality characteristics of online presence that induce online behavior. This research constitutes evidence that the aggregated model can be effective in accounting for usage behavior, especially within the online context and the proposed model extension. The research also provides a theoretical understanding of how users' perceptions of website design quality dimensions (e.g., ease of navigation, access, and loading time; content usefulness, completeness, and clarity; and appearance attractiveness, organization, and readability) are important features of a bank's website design. The research also demonstrates the role of website design quality perceptions and their impact on belief structures in the UTAUT model on the one hand and system usage behavior on the other hand.

From an implementation analysis perspective, the current work validates the UTAUT measures in addition to supporting the interrelationships among the key constructs in technology acceptance research. The study contributes to theory by providing a new perspective for the UTAUT, demonstrating that previously established relationships among the TAM constructs are also valid among the key constructs in the UTAUT within the context examined; this finding makes a new contribution to understanding the UTAUT.

6.2. Managerial contributions

Managers and website designers can benefit from the findings by reinforcing users' decisions, maintaining the quality of highly rated features of the website design quality dimensions, communicating these features to potential users, and making their web applications and services more engaging and commercially viable. A halo effect may influence the overall evaluation because the dimensions of website design quality are interrelated. The implication is that improvements to the design appearance of a website should result in an enhancement of the overall evaluation and greater usage intentions.

The model structure and the scale for website design quality have various potential managerial applications that can facilitate a quality program through two specific methods. First, the dimensional format of the instrument enables an organization to assess its level of website design quality in both decomposed detail and holistically. In doing so, managers can determine the relative importance of the four dimensions of website design quality and use the results to focus on the more salient elements. Second, organizations can use the instrument on an ongoing basis to track customer perceptions of website design quality and compare quality with that of its competitors.

The findings also demonstrate that experienced users rely on their perceptions of performance expectancy and website design quality to make decisions about system usage. In this study, users highly valued their perceptions of the benefits of performance expectancy, such as speed, time, and efficiency, second only to their perceptions of web design quality. The implications for managers are to build on these features and merits in attracting non-users and to reinforce the usage decisions of actual users by maintaining and improving efficiency characteristics. Though not examined in this study, the service profit chain (Heskett, Sasser, & Schlesinger, 1997) suggests that customer encounters influence customer satisfaction, service quality, and loyalty toward both employees and organizations. Thus, firms may be able to contribute to the achievement of organizational objectives through careful and creative management of website design quality, which has a significant influence on consumer behavior.

6.3. Limitations and further research

The study findings are subject to limitations in common with similar cross-section survey studies. First, the results cannot prove causality, and therefore research should undertake a longitudinal study. Second, the research was conducted in a single industry, and thus the results are limited to the specific domain of Internet banking. Although a single domain has the obvious benefit of controlling for cross-industry variation, caution must be taken when attempting to generalize the results to other industries, other forms of technologies, or other countries.

The results have several implications for further research. First, this research was successful in validating the measures and higher-order structure of the website design quality perceptions construct. However, the need persists to cross-validate these findings in other contexts. Second, research could apply the extended UTAUT model to other online behaviors, such as e-commerce or e-shopping. Third, given that most research focuses on TAM, the UTAUT model as a parsimonious, aggregated form of eight dominant TAMs may well form the vehicle for a change of direction. Researchers should investigate the effects of website design quality aspects as antecedents to performance expectancy, effort expectancy, and related usage behavior using the current research model. Previous information systems research examines the impact of system and information quality on system use and user satisfaction. Nevertheless, the dimensions of website design quality examined herein are broader and more comprehensive than previously reported, opening up opportunities for further research. Last, further research on the consequences of website design quality should include direct replication of the presented structural model in other industries, employing longitudinal data collection if possible.

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Figure 1
Conceptual model

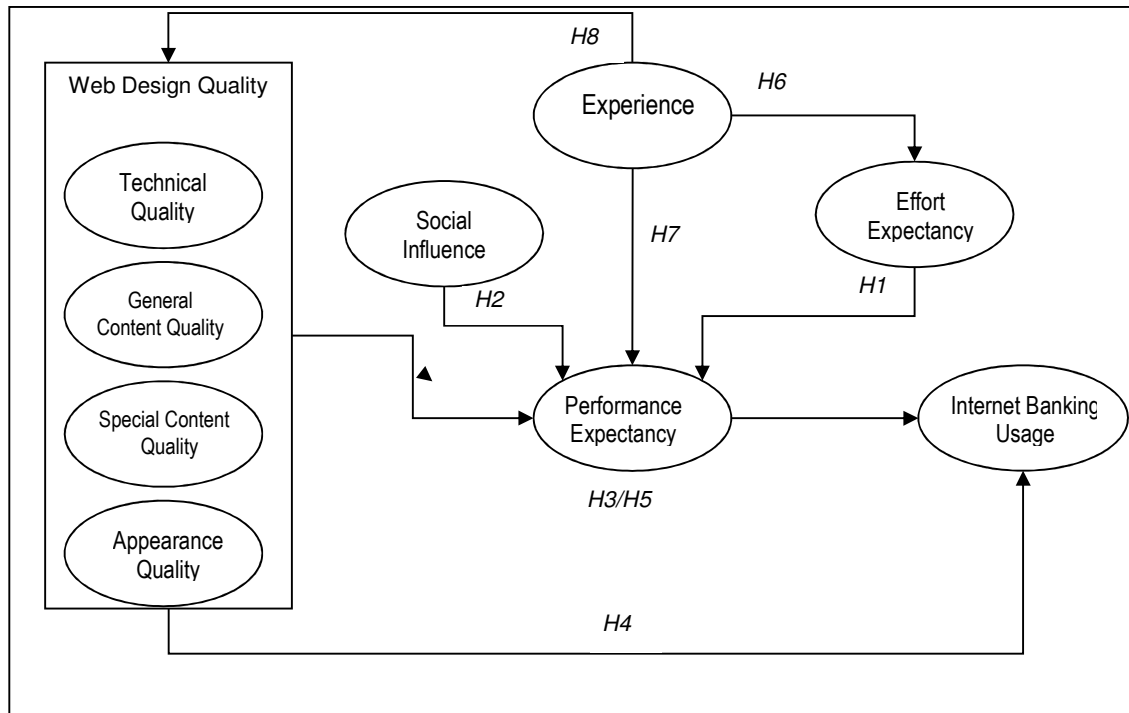


Figure 2
Structural model.

Standardized coefficients (t-value). Method: ML; $\chi^2 = 239.8$ (df = 162), $\chi^2/\text{df} = 4.1$, CFI = .975, RMSEA = .048.

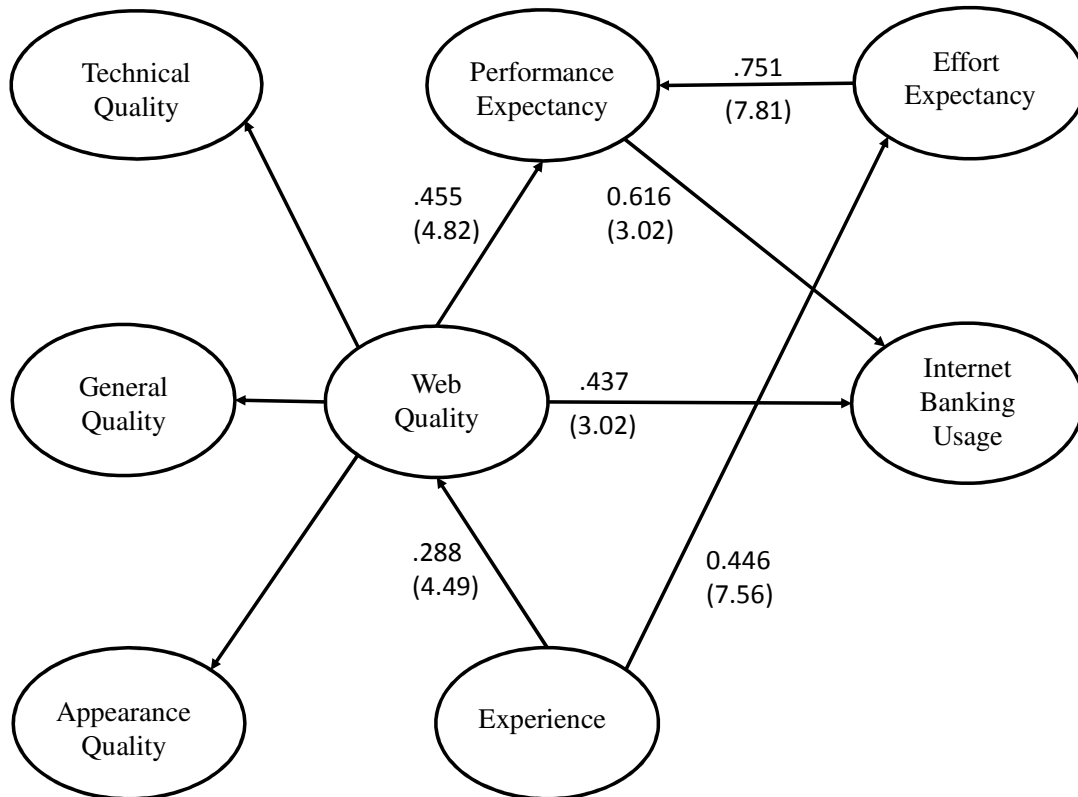


Table 1
Operational definitions of the variables.

Variable	Definition	Items
Performance Expectancy (PE) (Venkatesh et al., 2003)	The degree to which an individual believes that using Internet banking will help him/her perform banking tasks through this channel.	(PE 1-4) <ul style="list-style-type: none"> o I find Internet banking useful. o Using Internet banking enables me to accomplish banking tasks more quickly. o Using Internet banking increases the effective use of my time in handling my banking tasks. o Using Internet banking increases the quality of my banking services output at minimal efforts.
Effort Expectancy (EE) (Venkatesh et al., 2003)	The degree of ease associated with the use of Internet banking.	(EE 1-4) <ul style="list-style-type: none"> o My interaction with Internet banking is clear and understandable. o I am skilful at using Internet banking. o Learning to use the Internet banking system is easy for me. o I find it easy to get the Internet banking system to do what I want it to do.
Social Influences (SI) (Venkatesh et al., 2003)	The degree to which an individual believes that important others think that he/she should use Internet banking. Also measures bank staff support in usage of the Internet channel.	(SI 1-4) <ul style="list-style-type: none"> o People who are important to me think that I should use Internet banking facilities. o People who influence my behavior think I should use internet banking. o The bank staffs are helpful in the use of the Internet banking system. o The branch encourages the use of Internet channel.
Technical Quality (TQ) (Aladwani, 2006)	The technical characteristics of the website, such as security, ease of navigation, search facilities, site availability, valid links, personalization or customization, interactivity, and ease of access.	The Bank website: (TQ 1–8) <ul style="list-style-type: none"> o looks secure for carrying out transactions. o looks easy to navigate. o has adequate search facilities. o has valid links (hyperlinks). o can be personalized or customized to meet my needs. o has many interactive features (e.g., online application for bank services). o is easy to access. o pages load quickly.
General Content Quality (GQ) (Aladwani, 2006)	The characteristics of the bank website content in general, such as content usefulness, completeness, clarity, currency, conciseness, and accuracy.	The content of the bank's website is (GQ 1–6) <ul style="list-style-type: none"> o useful. o complete. o clear. o current. o concise. o accurate.
Special Content Quality (SQ) (Aladwani, 2006)	The specific content characteristics on a website, such as contact information, a firm's general information, product/service details, consumer policies, and customer support	On the bank's website I can find: (SQ 1–5) <ul style="list-style-type: none"> o contact information (e.g., e-mail addresses, phone numbers). o general bank information (e.g., goals, owners). o details about their products and services. o information related to customer policies (e.g., privacy and dispute details) o information related to customer services.
Appearance Quality (AQ) Aladwani, 2006)	The characteristics of the website appearance, such as attractiveness, organization, proper use of font, colors, and proper use of multimedia.	The bank website: (AQ 1–5) <ul style="list-style-type: none"> o looks attractive. o looks organized. o is easy to read. o uses appropriate colors. o uses multimedia features properly.
Experience (EXP) Adapted from Lassar et al. (2005)		How would you describe your: (EXP 1-2) <ul style="list-style-type: none"> o Internet knowledge. o general computer knowledge.
Internet Banking Usage (IB Usage) Adapted from Venkatesh et al. (2008) and Thompson, Higgins & Howell (1994)		(IBU 1-2) <ul style="list-style-type: none"> o On weekly basis, how many times do you use Internet banking? o How long have you been using Internet banking facilities?

Table 2

Second-order factor variance: Estimates, CRs, and labels for critical ratios of differences.

	Estimates	Critical Ratios (CR)
Residual 1 (F1)	.169	5.078
Residual 2 (F2)	.114	3.646
Residual 3 (F4)	.112	3.943

Table 3

Standardized factor loadings (regression weights), variance extracted (squared multiple correlations), and reliability estimates.

	GQ	AQ	TQ	PE	EE	SI	EXP	IB Usage
GQ1	.85							
GQ2	.85							
GQ3	.88							
GQ6	.74							
AQ1		.83						
AQ2		.90						
AQ3		.86						
TQ8			.88					
TQ7			.86					
TQ2			.79					
PE1				.86				
PE2				.94				
PE3				.89				
EE2					.89			
EE3					.89			
EE4					.81			
SI1						.87		
SI2						.97		
EXP1							.97	
EXP2							.90	
IBU1								.63
IBU2								.86
AVE	70.0%	74.7%	71.7%	80.6%	74.9%	84.5%	87.1%	56.9%
Reliability	.90	.89	.88	.92	.90	R=.84	R=.93	R=.54

PE = Performance Expectancy

EE = Effort Expectancy

SI = Social Influences

TQ = Technical Quality

GQ = General Content Quality (GQ)

SQ = Special Content Quality (SQ)

AQ = Appearance Quality

EXP = Experience

IB Usage = Internet Banking Usage

Table 4
Squared correlation matrix.

	SI	EE	PE	EXP	IB Usage	WQ	AQ	GQ	TQ
SI	.85								
EE	0.06	.75							
PE	0.06	0.52	.81						
EXP	0.06	0.39	0.24	.87					
IB Usage	0.10	0.40	0.48	0.30	.57				
WQ	0.19	0.28	0.39	0.10	0.37	.74			
AQ	0.14	0.20	0.28	0.08	0.28	0.734	.75		
GQ	0.14	0.20	0.28	0.08	0.28	0.73	0.54	.70	
TQ	0.14	0.20	0.28	0.08	0.28	0.73	0.54	0.54	.72

Notes: Average variances extracted are on the diagonal. The values below the diagonal are the squared correlations between the constructs.

Table 5
Structural path estimates.

Hypothesis	Paths			Coefficient	S.E.	t	P	Result
H1	TEE	→	TPE	.751	.096	7.812	***	Supported
H3	TPE	→	IB usage	.616	.103	5.966	***	Supported
H4	WQ	→	IB usage	.437	.145	3.021	**	Supported
H5	WQ	→	TPE	.455	.094	4.821	***	Supported
H6	Exp	→	TEE	.446	.059	7.564	***	Supported
H8	Exp	→	WQ	.288	.064	4.487	***	Supported

Note: *** p<.001; ** p<.01; * p<.05.